

Cities of North Logan & Mendon, Utah

# PRICING WATER FOR CONSERVATION

Thanks to:  
USDI Bureau of Reclamation  
Water Conservation Field Services Program  
Cooperative Agreement #02-FC-40-8010

Submitted to:  
North Logan City Mayor and Council  
Mendon City Mayor and Council  
Bureau of Reclamation Provo Area Office

By the:  
Utah Association of Conservation Districts  
Utah Division of Water Resources  
USU Center for Water-Efficient Landscaping  
USU Extension Service  
Cache County Master Gardeners

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## INTRODUCTION

Northern Utah's Cache County has long been known as an oasis in the Great Basin desert. In recent years, however, declining water supplies and increasing demands have raised concerns about the sustainability of the area's abundant water supply. A prolonged statewide drought and increasing water usage by a growing population have combined to put a squeeze on cities needing to provide for long-term water supplies.

This report documents the investigation by two small municipalities, North Logan and Mendon, of the various pricing models used for pricing culinary water for conservation in Utah.

The Utah Association of Conservation Districts under a grant from the Bureau of Reclamation Water Conservation Field Services Program (Cooperative Agreement #02-FC-40-8010) has coordinated the related research and assistance needed by both cities. The project team has included specialists from the Utah Division of Water Resources, the USU Center for Water-Efficient Landscaping, USU Extension Service and Cache County Master Gardeners.

An initial report, "Pricing Water for Conservation," was submitted to the City of North Logan (population 6,500) mayor and council July 18, 2002. At that meeting the City requested that a conservation price structure using the "increasing block rate" alternative be developed for North Logan.

Included in the Appendix is the Utah Division of Water Resources December 2002 "Water Rate Analysis for North Logan City" presented to the mayor and council December 19, 2002. It makes specific recommendations for a new rate structure that the city is now considering and will be used to inform and educate the citizens of the community over the next few months. The Utah Division of Water Resources is completing a similar analysis and recommendation for a conservation rate structure for Mendon (population 300).

The above federal, state and local conservation partners have worked at and under the direction of both cities' governing bodies and appointed water committees. The principal purpose of the project was to assist two small Utah municipalities develop water-pricing models that could be implemented to give financial incentive to conserve culinary water supplies. Project tasks have included:

- 1) evaluating existing Utah water pricing ordinances,
- 2) developing alternatives and evaluating the economics of various models,
- 3) engaging elected officials and citizens of respective city appointed committees,
- 4) conducting workshops, public meeting and hearings to educate citizens and
- 5) developing pricing models that could be implemented.

## BACKGROUND

North Logan City recently completed a water system master plan update (Bowen Collins and Associates, Inc. February 2002) evaluating the city's water supply, infrastructure, future needs and recommendations for improvements. Related facts from the Bowen Collins report are:

- *North Logan...has grown from a population of 3,796 in 1990 to 6,150 in 2000, an increase of 62 percent. (p2-1)*
- *Future growth will occur mainly on the northeast side of the City and on remaining undeveloped agricultural land...(p2-1)*
- *City staff estimates that full build-out population will be 27,500, estimated to occur in 2050. (p2-1)*
- *Table 2-1 estimates population to growth to 17,500 by 2020. (p2-1)*
- *Figure 6-1, Storage Requirements, estimate deficits to begin in 2003.*
- *Fig. 4-1, Maximum Day Demand vs. Supply estimates deficits to begin in 2011.*
- *The current city water supply is adequate to 2020 for total year demand with an increasing dependence on the 1<sup>st</sup> West Well. (p4-3)*
- *Table 2-3 shows how North Logan culinary water used for outdoor water use (as a percentage of total water use) compares to Utah and Mountain States averages. It is lower due to secondary water systems now in use by many residents. (p2-2)*

*The report recommends that the City prepare a water conservation plan, as required by state law. The wise and efficient use of water is important and the City should continue efforts to improve efficiency and encourage conservation. However, even the most successful conservation efforts will not eliminate the need for additional water supplies to meet the future demands of the City (page 4-3).*

The report did not evaluate water conservation but provides a firm basis for studying and implementing a city conservation policy. The City has adequate water supplies for the present, but water is a limited resource and could be utilized in even greater quantities for outdoor water use as the City continues to develop in areas without secondary irrigation. A proactive approach to water conservation now could go a long way toward:

- 1) educating citizens on the importance of conserving culinary water;
- 2) guiding land development decisions toward smaller lots and more water efficient landscapes;
- 3) encouraging secondary water systems for outside irrigation; and
- 4) generally assuring that the City is prepared for the future when demand on the city water supply increases.

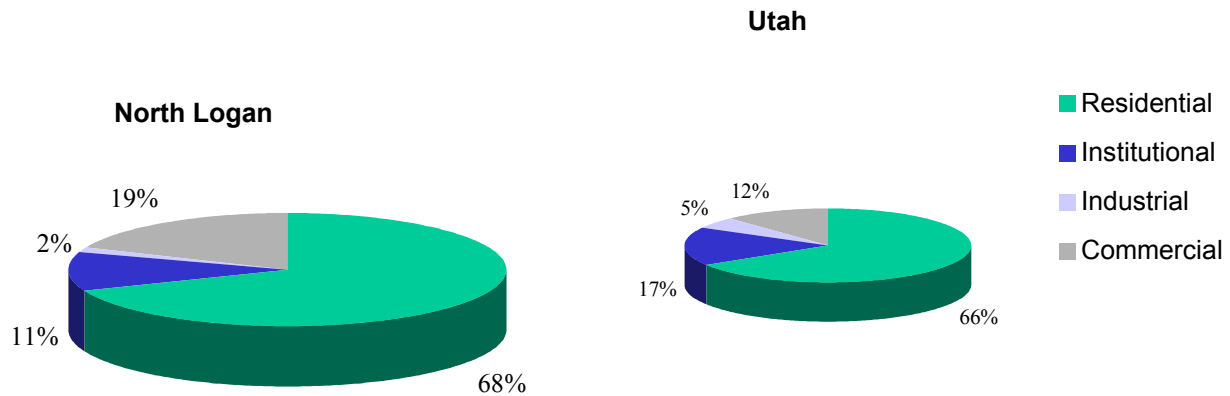
## CULINARY WATER USE ANALYSIS

The Utah Division of Water Resources Water Conservation Section completed an analysis of the City water use for fiscal year 2001 (July 1, 2000 to June 30, 2001) based on water billing information provided by the City. Table 1 shows the water use and amounts billed by general customer class. Figures 1 and 2 show the comparison to the Utah averages.

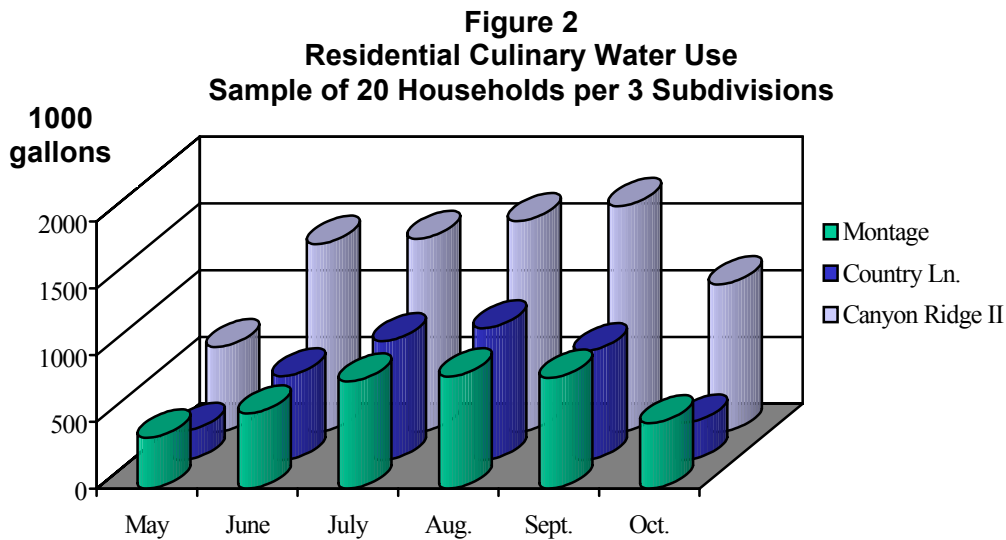
**Table 1**  
**FY 2001 North Logan Culinary Water Use**

Category	Gallons (1,000)	%	Income \$	%
Residential	256,824	68.8	481,664	76.1
Institutional	41,857	11.2	29,171	4.6
Industrial	5,671	1.5	10,932	1.7
Commercial	69,179	18.5	111,652	17.6
Total	373,531		633,419	

**Figure 1**  
**Water Use Comparison**

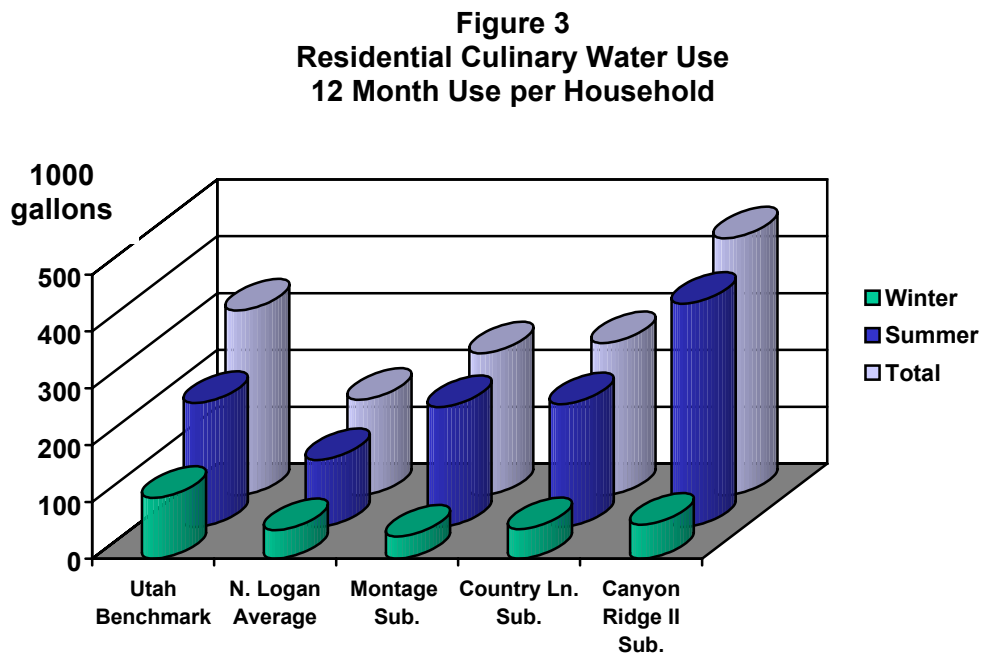


To further evaluate the future demand of residential development on the City culinary water supply 20 households in each of three subdivisions were compared for the 6-month periods May to October (summer use) and November to April (winter use). These developments are different, but representative of the relationship of residential growth to culinary water use. Figure 2 illustrates the summer water use by month for the Montage, Country Lane and Canyon Ridge Phase II subdivisions. The Montage and Country Lane developments are in R-1-10 zones with moderate sized homes on 10,000 sq. ft. lots. Montage has secondary irrigation as part of the development compared to Country Lane that does not. The Canyon Ridge Phase II development is in the RE-1 zone above the Logan Hyde Park Smithfield Canal with moderate to larger homes on ½ acre lots relying totally on culinary water for outside irrigation during the summer months.



The Division of Water Resources for planning purposes estimates the average household in Utah uses 1 acre foot of water per year. This is the equivalent of an acre of water, 1 foot deep and would account for all water used including secondary irrigation water. For this evaluation secondary irrigation water is not accounted for since we do not have that information for North Logan City. Figure 3 shows how the winter, summer and total culinary water use for the three sample subdivisions compares to the Utah benchmark and North Logan average residential household water use.

It was noted that during fiscal 2001 one institutional account used 23.9 million gallons of water, yet was only billed \$74.05. If this was the water used by city government the City should consider the merits of having the City pay for the water it uses as opposed to that cost being paid by other water users.



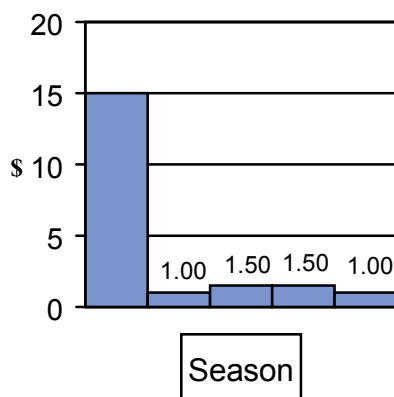
## PRICING WATER FOR CONSERVATION

### Pricing Structure Evaluation

Following are different water pricing methods used by municipalities and water companies in Utah prepared by Lyle Summers, economist for the Utah Division of Water Resources. For each is a brief description, a graphic illustrating the application of the rate and a model water bill computation to determine the total cost. The seasonal rate, increasing block rate and ascending block rate structures are designed to encourage conservation. The flat rate method is the rate structure currently used by North Logan City. A base fee of \$15 is used in each example.

**Figure 4  
Seasonal Rate**

Rate increases during high demand season.

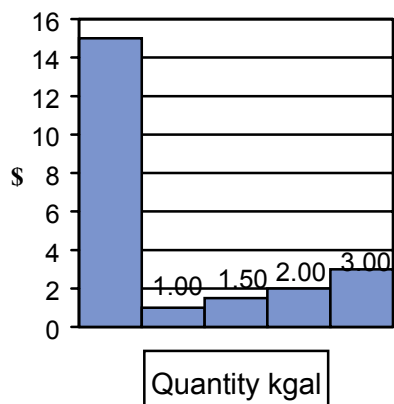


07/10/02 to 08/06/02 1255 1317 62

Total Usage	62 Units @ \$1.50	
		= \$93.00
	Base Fee	\$15.00
<b>Total Cost</b>		<b>\$108.00</b>

**Figure 5  
Increasing Block Rate**

Rate increases with each succeeding block of usage.

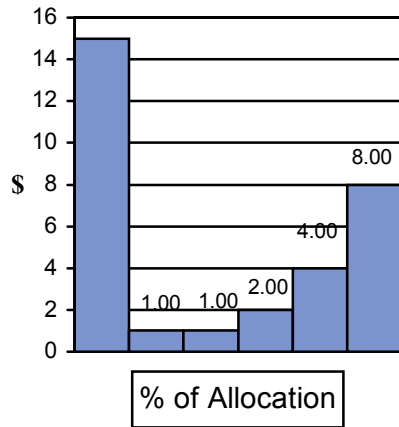


07/10/02 to 08/06/02 1255 1317 62

Tier (Kgal)	Rate/Kgal.	
1-10	1.00	\$10.00
11-20	1.50	\$15.00
21-30	2.00	\$20.00
31-62	3.00	\$96.00
Base fee		\$15.00
<b>Total Cost</b>		<b>\$156.00</b>

**Figure 6  
Ascending Block Rate**

Rate increases after allocation is exceeded.



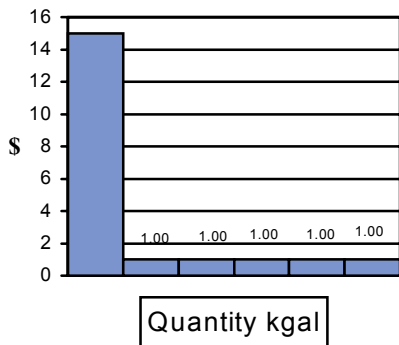
07/10/02 to 8/06/02 1255 1317 62

Allocation for billing period 39 kgal.

Tier	Kgal	Rate	Cost
Conservation	39	\$1.00	\$39.00
Inefficient	20	\$2.00	\$40.00
Excessive	3	\$4.00	\$12.00
Wasteful	0	\$8.00	\$ 0.00
Total Used	62		
Base Fee			<u>\$15.00</u>
<b>Total Water Cost</b>			<b>\$106.00</b>

**Figure 7  
Flat Rate**

Rate remains constant regardless of use.



07/10/02 to 8/06/02 1255 1317 62

Usage 62 kgal @ \$1.00 = \$62.00

Base Fee	<u>\$15.00</u>
<b>Total Water Cost</b>	<b>\$77.00</b>

Table 2 compares the cost using the above methods for two reasonable levels of water use in a billing period, 62,000 gallons and 39,000 gallons.

**Table 2  
Rate Comparison**

Use	Seasonal	Increasing Block	Ascending Block	Flat
62 kgal	\$108.00	\$156.00	\$106.00	\$77.00
39 kgal	\$73.00	\$87.00	\$54.00	\$54.00



## WATER RATES FOR COMPARABLE UTAH CITIES

The following information was researched and provided by Molly Waters, Water Conservation Specialist for the Utah Division of Water Resources. North Logan City and Mendon City water rates are compared to other cities with a similar number of water connections.

Tables 3 and 5 outline the rate structures currently used by small municipalities in Utah. The related ordinances for the Cities of Draper, Aurora and Coalville and Ballard Water and Sewer District are included as examples in the Appendix.

The cities are grouped according to total number of connections in order to make comparisons to the two communities participating in this study, North Logan with 1589 connections is compared to communities with 1,500 to 2,500 connections. Mendon with 351 connections is compared to communities with 200 to 500 connections.

Tables 4 and 6 compare the average monthly and annual cost for a typical family of four with a quarter-acre landscaped area.

### North Logan City

The group size, 1,500 to 2,500 connections, consists of seventeen water entities on record. The largest entity in this group is Heber City, with 2,495 connections. The smallest water purveyor is the City of Kanab with 1,572 connections. Average number of connections in this group is 1,900.

Five of the seventeen cities in North Logan's size group have multi-tiered block rate structures. None of these cities employ descending, seasonal or ascending block rate structures. The town of Ivins has the most number of tiers (3). Average increase among tiers for the entire group is 46.9 percent.

North Logan calculates to be the second most expensive water rate in its size range, with an annual cost of \$565.33. Draper City was the most expensive at \$682.04. The lowest cost of water was in the City of Hyrum at \$179.58. Average cost for the entire size range was \$302.61.

**Table 3**  
**Culinary Water Pricing**  
**Communities with 1500 – 2500 Connections**

Name	Conn.	Base	Limit Kgal	Ovg 1	Limit Kgal	Ovg 2	Limit Kgal	Ovg 3	Limit Kgal
Alpine City Corporation	1779	\$6.60	8	\$0.90	60	\$1.40	115	\$2.80	
Draper City Water System	2000	\$21.00	5	\$1.75					
Grantsville Municipal Water System	1690	\$15.00	7	\$0.70					
Heber City Water System	2495	\$9.60	10	\$0.72					
Highland Culinary Water	1980	\$10.00	6	\$0.60	15	\$1.00			
Hyrum City Water System	2231	\$8.00	10	\$0.45	50	\$0.65			
Ivins Town Water	1785	\$10.00	5	\$0.75	10	\$0.85	20	\$0.95	

Kanab Municipal Water System	1572	\$25.00	10	\$0.90		
Moab City Water Department	1775	\$5.54	2	\$0.44	12	\$0.60
Nephi City Water System	1701	\$7.50	5	\$0.60		
<b>North Logan Culinary Water System</b>	<b>1589</b>	<b>\$7.11</b>	<b>0</b>	<b>\$1.57</b>		
North Salt Lake Municipal Water System	2084	\$7.25	7	\$0.72		
Riverdale City Water System	1939	\$9.35	15	\$0.70		
Smithfield Municipal Water System	2181	\$8.00	6	\$0.50		
South Davis County Water Improvement District	2060	\$8.50	10	\$0.70		
Sunset City Water System	1654	\$11.10	10	\$0.40		
Tremonton Municipal Water System	1780	\$13.00	13	\$1.13		

**Table 4**  
**Respective Water Charges**

based on a typical family of four with a quarter-acre landscaped area (305,734 gallons per household per year).

<b>Name</b>	<b>Base</b>	<b>Ovg</b>	<b>Monthly</b>	<b>yearly</b>
Alpine City Corporation	\$6.60	\$15.73	\$22.33	\$267.96
Draper City Water System	\$21.00	\$35.84	\$56.84	\$682.04
Grantsville Municipal Water System	\$15.00	\$12.93	\$27.93	\$335.22
Heber City Water System	\$9.60	\$11.14	\$20.74	\$248.93
Highland Culinary Water	\$10.00	\$15.88	\$25.88	\$310.56
Hyrum City Water System	\$8.00	\$6.97	\$14.97	\$179.58
Ivins Town Water	\$10.00	\$15.36	\$17.45	\$209.40
Kanab Municipal Water System	\$25.00	\$13.93	\$38.93	\$467.16
Moab City Water Department	\$5.54	\$12.49	\$18.03	\$216.36
Nephi City Water System	\$7.50	\$12.29	\$19.79	\$237.44
<b>North Logan Culinary Water System</b>	<b>\$7.11</b>	<b>\$40.00</b>	<b>\$47.11</b>	<b>\$565.33</b>
North Salt Lake Municipal Water System	\$7.25	\$13.30	\$20.55	\$246.65
Riverdale City Water System	\$9.35	\$7.33	\$16.68	\$200.22
Smithfield Municipal Water System	\$8.00	\$9.74	\$17.74	\$212.87
South Davis County Water Improvement District	\$8.50	\$10.83	\$19.33	\$232.02
Sunset City Water System	\$11.10	\$6.19	\$17.29	\$207.49
Tremonton Municipal Water System	\$13.00	\$14.10	\$27.10	\$325.20

## Mendon City

The group size, 200 to 500 connections, consists of forty-four water entities on record. The largest entity in this group is Jensen Water Improvement District, with 482 connections. The smallest water purveyor is Circleville with 200 connections. Average number of connections in this group is 301.

Thirteen of the forty-four cities in Mendon's size group (200 – 500 connections) have multi-tiered block rate structures. None of these cities employ descending, seasonal or ascending block rate structures. The cities of Enterprise, Goshen, Holden, and Uintah have the most number of tiers (3). Average increase among tiers for the entire group (disregarding Holden's first-tier increase, which is 900 percent) is 54 percent.

Mendon calculates to be just about average in its size range, with an annual cost of \$295.44. The city of Tropic was the most expensive at \$827.47. The lowest cost of water was in the City of Kanosh at \$148.43. Average cost for the entire size range was \$338.72.

**Table 5**  
**Culinary Water Pricing**  
**Communities with 200 – 500 Connections**

Name	Conn.	Base	Limit Kgal	Ovg 1	Limit Kgal	Ovg 2	Limit Kgal	Ovg 3	Limit Kgal
Annabella Municipal Water System	220	\$17.00	15	\$1.50					
Aurora Municipal Water System	335	\$23.10	15	\$1.75					
Ballard Water Improvement District	294	\$20.00	10	\$1.10					
Centerfield Water and Improvement District	378	\$13.00	10	\$0.50					
Circleville Culinary Water	200	\$12.00	10	\$0.25					
Coalville Culinary Water	473	\$14.45	8.5	\$1.70					
Copperton Improvement District	295	\$15.00	10	\$1.00	40	\$1.50			
Diamond Valley Acres Water Company	242	\$15.00	30	\$1.00					
Dixie Deer Special Service District	280	\$25.00	12	\$0.50	15	\$1.00			
Elk Ridge Corporation	430	\$20.00	12	\$1.00	26	\$1.25			
Elwood Town Water System	214	\$15.00	300	\$0.50					
Enterprise Culinary Water System	495	\$24.00	24	\$0.50	36	\$0.75	75	\$1.00	
Fountain Green	341	\$22.00	6	\$0.15					
Francis Culinary Water	273	\$30.00	10	\$0.50					
Glendale Town Water	206	\$19.00	12	\$1.50					
Goshen Culinary Water	333	\$32.00	40	\$0.50	50	\$1.00	160	\$2.00	
Hinckley City Water	260	\$12.00	10	\$0.50					
Holden Town Corporation Water	219	\$16.50	60	\$0.50	80	\$5.00	100	\$7.50	
Honeyville Municipal Water System	406	\$16.00	30	\$0.50					
Jensen Water Improvement District	482	\$17.50	10	\$0.90					
Kanosh City Water System	237	\$11.00	20	\$0.25					
Levan Culinary Water	282	\$23.00	40	\$0.75					
Loa Water Works Company	292	\$8.00	12	\$0.45	70	\$0.50			
Marysville Culinary Water	323	\$13.00	20	\$0.35	40	\$0.50			
Mayfield Water Department	201	\$22.00	15	\$1.00					
<b>Mendon City Water</b>	<b>351</b>	<b>\$22.00</b>	<b>18</b>	<b>\$0.35</b>					
Millville City Water	408	\$17.00	0	\$0.60					
Minersville Town Water System	307	\$15.25	10.5	\$0.30	60.5	\$0.50			
Neola Water District	212	\$21.50	8	\$1.19					
Newton Town Water	250	\$15.50	20	\$0.30					
Oak City Municipal Water System	234	\$20.00	15	\$1.00	30	\$1.25			
Paradise Town	240	\$24.00	10	\$1.40					
Paragonah Municipal Water System	236	\$15.00	10	\$0.20					
Randolph City Water System	212	\$16.00	15	\$0.75					
Redmond Municipal Water System	284	\$20.00	10	\$1.25					
Scipio Culinary Water System	261	\$17.50	20	\$0.85					
Spring City Municipal Water System	363	\$20.00	5	\$0.50	20	\$1.00			
Tabiona Water System	248	\$12.00	13	\$3.00					
Toquerville Water Department	318	\$10.50	12	\$1.00	25	\$1.25			
Tridell-Lapoint Water Improvement District	380	\$15.00	0	\$0.50					
Tropic	210	\$21.00	1.5	\$2.00					
Uintah Municipal Water System	395	\$10.00	15	\$0.60	65	\$1.25	105	\$1.50	

Ukon Water Company	317	\$15.00	12	\$1.00
Veyo Culinary Water Association	288	\$20.00	30	\$0.50

**Table 6**  
**Respective Water Charges**

based on a typical family of four with a quarter-acre landscaped area (305,734 gallons per household per year).

<b>Name</b>	<b>Base</b>	<b>Ovg</b>	<b>monthly</b>	<b>yearly</b>
Annabella Municipal Water System	\$17.00	\$15.72	\$32.72	\$392.60
Aurora Municipal Water System	\$23.10	\$18.34	\$41.44	\$497.24
Ballard Water Improvement District	\$20.00	\$17.03	\$37.03	\$444.31
Centerfield Water and Improvement District	\$13.00	\$7.74	\$20.74	\$248.87
Circleville Culinary Water	\$12.00	\$3.87	\$15.87	\$190.43
Coalville Culinary Water	\$14.45	\$28.86	\$43.31	\$519.75
Copperton Improvement District	\$15.00	\$15.48	\$30.48	\$365.74
Diamond Valley Acres Water Company	\$15.00	\$0.00	\$15.00	\$180.00
Dixie Deer Special Service District	\$25.00	\$11.98	\$36.98	\$443.76
Elk Ridge Corporation	\$20.00	\$13.48	\$33.48	\$401.74
Elwood Town Water System	\$15.00	\$0.00	\$15.00	\$180.00
Enterprise Culinary Water System	\$24.00	\$0.74	\$24.74	\$296.87
Fountain Green	\$22.00	\$2.92	\$24.92	\$299.06
Francis Culinary Water	\$30.00	\$7.74	\$37.74	\$452.87
Glendale Town Water	\$19.00	\$20.22	\$39.22	\$470.60
Goshen Culinary Water	\$32.00	\$0.00	\$32.00	\$384.00
Hinckley City Water	\$12.00	\$7.74	\$19.74	\$236.87
Holden Town Corporation Water	\$16.50	\$0.00	\$16.50	\$198.00
Honeyville Municipal Water System	\$16.00	\$0.00	\$16.00	\$192.00
Jensen Water Improvement District	\$17.50	\$13.93	\$31.43	\$377.16
Kanosh City Water System	\$11.00	\$1.37	\$12.37	\$148.43
Levan Culinary Water	\$23.00	\$0.00	\$23.00	\$276.00
Loa Water Works Company	\$8.00	\$6.07	\$14.07	\$168.78
Marysville Culinary Water	\$13.00	\$1.92	\$14.92	\$179.01
Mayfield Water Department	\$22.00	\$10.48	\$32.48	\$389.74
<b>Mendon City Water</b>	<b>\$22.00</b>	<b>\$2.62</b>	<b>\$24.62</b>	<b>\$295.44</b>
Millville City Water	\$17.00	\$15.29	\$32.29	\$387.44
Minersville Town Water System	\$15.25	\$4.49	\$19.74	\$236.92
Neola Water District	\$21.50	\$20.80	\$42.30	\$507.59
Newton Town Water	\$15.50	\$1.64	\$17.14	\$205.72
Oak City Municipal Water System	\$20.00	\$10.48	\$30.48	\$365.74
Paradise Town	\$24.00	\$21.67	\$45.67	\$548.03
Paragonah Municipal Water System	\$15.00	\$3.10	\$18.10	\$217.15
Randolph City Water System	\$16.00	\$7.86	\$23.86	\$286.30
Redmond Municipal Water System	\$20.00	\$19.35	\$39.35	\$472.17
Scipio Culinary Water System	\$17.50	\$4.66	\$22.16	\$265.88
Spring City Municipal Water System	\$20.00	\$10.24	\$30.24	\$362.87
Tabiona Water System	\$12.00	\$37.43	\$49.43	\$593.21
Toquerville Water Department	\$10.50	\$13.48	\$23.98	\$287.74
Tridell-Lapoint Water Improvement District	\$15.00	\$12.74	\$27.74	\$332.87
Tropic	\$21.00	\$47.96	\$68.96	\$827.47
Uintah Municipal Water System	\$10.00	\$6.29	\$16.29	\$195.44
Ukon Water Company	\$15.00	\$13.48	\$28.48	\$341.74
Veyo Culinary Water Association	\$20.00	\$0.00	\$20.00	\$240.00

## WATER CONSERVATION ORDINANCES

Excerpts from water conservation and landscape ordinances in Utah are provided hereafter by Kelly Kopp, water conservation specialist with the USU Center for Water-Efficient Landscaping. In addition, she reviewed the North Logan City and Mendon City landscape requirements in the Land Use part of the code for obstacles to water conservation and landscaping. The paragraphs listed hereafter should be reconsidered and could be amended in the next revision of the respective North Logan City code. They are:

*“Paved and graveled walkways and the use of gravel or similar materials as to landscape feature **shall not exceed 20% of the required landscaped area.**”*

*“The area with the public right-of-way...shall be landscaped by the developer. **No trees may be located within the public right-of-way...**”*

The Cities should consider including efficient water use and conservation requirements appropriate to North Logan and/or Mendon in the land use code and/or subdivision ordinance.

The landscape requirements for commercial development should be reviewed and efficient water use and conservation requirements included. Commercial subdivisions should be required to submit a water conservation plan as part of the development plan. Individual building permit applications should include a landscape plan that would be reviewed and approved as part of the application process. The Jordan Valley Water Conservancy District Model Landscape Ordinance is an example of such requirements.

### Common Landscaping Ordinances

“The plants and other landscaping material that best serve the intended functions shall be used. Landscaping materials shall be appropriate for the local environment, soil conditions and availability of water.”

“...the selection of plant species suited to dry conditions is appropriate.”

“...shall recognize the climatic and geologic limitations of the Provo City area and the need for water conservation.”

“The use of drought-tolerant vegetation is encouraged in required landscape areas, especially hillside areas.

“Xeriscape landscaping may include a combination of drought resistant trees, shrubs, ground covers, organic mulches as well as some dry landscape materials.”

“Vegetative materials shall be selected from among those known to be suitable to the climate of the city. In order to foster water conservation programs the use of native plants or other plant material proven to require minimal watering shall be permitted and encouraged.” (North Logan)

## **Common Water Waste Ordinances**

“It shall be unlawful for any water user to waste water, or allow it to be wasted, by imperfect stops, taps, valves, leaky joints or pipers, or allow tanks or water troughs to leak or overflow or to wastefully run water from hydrants, faucet, or stops or through basins, water closets, urinals, sinks, or apparatus or to use water in violation of the rules, regulations, or ordinances for controlling the City water system.”

Cities: Santaquin, South Salt Lake, Provo, Roosevelt, Syracuse, Spanish Fork, Park City, Draper, Sandy

## **Common Scarcity of water Ordinances or Water Emergencies**

“In times of scarcity of water, whenever it shall in the judgment of the Mayor and City Council to be necessary, the Mayor shall by proclamation limit the use of water for other than domestic purpose to such extent as may be necessary for the public good. It shall be unlawful for any person by himself, family, servants, or agents, to violate any proclamation made by the Mayor in pursuance of this Section.”

Cities: Provo, Syracuse Spanish Fork, Santaquin, Park City

## **Requirement for Landscape Plans**

**Cities:** Salt Lake City, Murray, Draper, Sandy (licensed LA), Bountiful (licensed LA), Riverdale (licensed LA), Provo (licensed design professional)

## **Specific Landscape Requirements or Design Standards**

Tree size (caliper), shrub diameter, ration of shrubs to trees, number of trees per unit area, percentage area of landscaping, etc.

Cities: Murray, Bountiful, Vernal, Salt Lake City, Riverdale, Provo, Draper, North Logan

## **Requirements to Irrigate**

“Entire area....shall be landscaped and irrigated.” (Murray)

“Permanent irrigation shall be installed and used as needed to maintain plant material in a healthy state.” (Salt Lake City)

“...all irrigation systems shall be designed to minimize the use and run-off of water.”

Cities: Murray (all zones except single-family residential), Salt Lake City (commercial), Provo

## **Requirement for Irrigation Plans**

Cities: Sandy, Salt Lake City

## **Requirement for Irrigation Schedule**

Cities: Sandy

## **Design Standards for Irrigation Systems**

Minimum efficiency, pressure regulation, slope requirements, irrigation zone requirements, etc.

Cities: Sandy

## **Educational Materials Requirement**

Cities: Sandy (single-family dwellings)

## **Parkstrip or Parkway Requirements**

“At the discretion of the community development director...”

“...landscaping between curb and sidewalk shall be required...”

“...shall be landscaped with grass and plantings permitted...”

“No portion of any park strip shall be paved or surfaced...”

“All parkways over twenty-four inches in width shall be landscaped...”

“Due to the maintenance and irrigation difficulties associated with narrow vegetated Parkways, impervious materials including brick pavers,...are permitted...Asphalt is not permitted.” (Pleasant Grove)

“The intent...is that thirty three percent or more of the park strip surface be covered with vegetation within the first three years of plantings...”

“Except as specified...any paving materials may be used in one hundred percent of a park strip that is twenty four inches or less in width.” (Salt Lake City)

“Parkways two feet or more in width shall be landscaped with turf grass. Parkways four feet or more in width shall include trees.” (Provo)

“Park strips and other landscaped areas less than eight feet wide shall be landscaped with water conserving plants and/or grass.” (Sandy)

Cities: Holladay, Bountiful, Layton, Park City, Pleasant Grove, Salt Lake City, Provo, Sandy, Draper, North Logan

### **Time of Day Watering Ordinance**

Cities: North Salt Lake, Sandy, Park City (exception for new plantings)

### **Alternate Day Water Ordinance**

Cities: Park City (exception for new plantings)

### **Irrigation Season Ordinance**

Cities: Park City (Sep 30-May 1), North Salt Lake (Oct 15-April 15)

### **Penalties for Non-Compliance**

Cities: North Salt Lake (fines), Sandy (termination, citation), Park City (fines)

### **Landscape Maintenance Requirements**

Weeding, pruning, trimming, etc.

“Free from weeds and debris...”

“...maintained in good condition so as to present a healthy, neat and orderly appearance...”

Cities: Bountiful (landscaped areas and irrigation systems), Vernal, Salt Lake City, Provo, North Logan

### **Plant Lists**

Street tree list.

Cities: Bountiful (all new building except single-family and duplex dwellings)

### **Water Conservation Rates**

“All water...in excess of 5,000 gallons per meter per month between June 1 and September 30...shall be billed at the rate established by resolution.

“...rates established by this Title are based on the City’s cost of providing water service which may change.”

Cities: Park City



## **Landscaping Term Definitions**

Cities: Salt Lake City, Provo, Sandy, Layton, North Logan

## **Turfgrass Restrictions**

“Domestic turf grasses should be used in areas with less than a fifty percent slope to prevent the runoff of irrigation water.”

In park strips: “Permitted on slopes less than 3:1.”

“Sod shall be used in areas with less than a ten percent slope to prevent the runoff of irrigation water.”

Cities: Salt Lake City, Provo

## **Xeriscape Principles**

Cities: Draper, Sandy

## **WATER CONSERVATION EDUCATION**

Education is important if the city is to get residents to be efficient in the use of city water. A conservation pricing structure would be an added financial reason to implement water conservation measures encouraged by the city through education. Since the largest use of water is for green landscapes during summer months the average citizen needs information on the “how to” of low water use landscaping and irrigation scheduling. Education should be geared to informing citizens and encouraging voluntary conservation of city water and secondary irrigation water. Following are the subcommittee’s recommendations specific to North Logan City:

1. Subdivision approval. Require a water conservation plan. Where culinary water is the only source of water for outside irrigation include a note on the plat to inform purchasers of lots. The note included on the Foothill North Subdivision Phase 1 is a good example.

*“Landscaping. This development is provided with culinary water ONLY. Water conserving landscapes and plant materials will reduce the amount of city water needed and cost of water to lot owners. To the extent reasonably possible, owners shall comply with the water conservation, vegetation, and landscaping standards and suggestions in the water conservation professional report for this development, available at the North Logan City office.”*

2. Building permits. Provide information when issued. This would inform lot owners of landscaping alternatives using lower water use designs and plants and where to get assistance. Examples of information that could be provided are included under the

Appendix. Drought resources and information can be obtained on the Web at <http://extension.usu.edu/drought>.

3. Workshops. The city or the North Logan City Library could facilitate training. USU Extension Horticulturist Loralie Platero has offered to teach workshops on strategies to conserve water where the sponsor has citizens signed up to participate. Mendon City has successfully held a three-session workshop teaching landscape design, plant materials selection, maintenance and mulching and irrigation sprinkler system options and scheduling. The flier that advertised the workshops and a hardcopy of a MS Powerpoint presentation of example plant materials and low water use landscapes (xeriscape) are included under the Appendix. Workshops are hands-on with participants completing plans and having them critiqued by a horticulturist or a Cache County Master Gardener.
4. Demonstration landscapes. Such landscapes are anticipated at the Eccles Ice Center and for the swale area for the North Village Phase II subdivision. The North Logan City Library Board has expressed support for demonstrating low water use grasses and design in the water retention area north of the library parking. The Cache County Master Gardeners have and would continue to give assistance.
5. Example residential landscapes. More citizens are including low water use designs and plants in their landscapes. The City could highlight these with a photo and/or recognition in the City newsletter. With the owner's permission the City could direct interested citizens to visit and/or meet with the respective homeowners. Also, the Cache County Master Gardeners could be contacted by the City or individual citizens for assistance or to participate in this program.
6. City government landscapes should be reviewed to determine compliance with requirements for commercial development. New city landscapes should be examples of efficient water use and conservation.
7. Water audits. The City should conduct audits to assess the efficiency of sprinkler irrigation for city properties. Such audits could be completed through the 1<sup>st</sup> Juvenile District Court program. Keith Shaw (435-750-1282, 435-512-3089) supervises youth who conduct these audits.
8. Home landscape water audits could be conducted by a USU Extension intern to assist property owners. These audits have become popular in Salt Lake County, are advertised and are assisting homeowners conserve water. Contact USU Extension Horticulturist Loralie Platero (435-752-6263). USU Extension has received limited funding under this project for this purpose.

## **WATER CONSERVATION PLAN**

The Water Conservation Plan Act passed by the Utah Legislature in 1998 requires water retailers with 500 or more connections to submit a conservation plan to the Division of Water Resources and update that plan each 5 years.

Such a plan for North Logan City would be a written document containing ideas, suggestions, or recommendations as to what can be done to help conserve water and limit or reduce its use in terms of per capita consumption so that adequate supplies of water are available for future needs.

The city administrator has been provided with a copy of a guide or model for a municipal water conservation plan prepared by the Utah Division of Water Resources. The City water official or water committee should complete a water conservation plan for North Logan City. Further as part of the City's overall effort to conserve water a person should be assigned as the City's water conservation coordinator.

# APPENDICES

Project Committee Members

Water Rate Analysis for North Logan City

Information to be included with building permits

Mendon City Landscape Workshops  
& Xeric Landscapes Examples

Example Water Rate Ordinances & Resolutions

## **Project Committee Members Water Pricing for Small Utah Municipality**

Gordon L. Younker  
North Logan City Council  
Utah Association of Conservation Districts

Bruce Lundquist  
North Logan City Council  
USDA Farm Service Agency

Peggy Gilles  
Utility Billing Department  
North Logan City

Jon Hardman  
Mendon City Council  
USDA Natural Resources Conservation Service

Lyle Summers  
Water Conservation Section  
Utah Division of Water Resources

Molly Waters  
Water Conservation Section  
Utah Division of Water Resources

Kelly Kopp  
Center for Water-Efficient Landscaping  
Utah State University

Loralie Platero  
Cooperative Extension Services  
Utah State University

Jennifer Meyers  
Cache County Master Gardeners

# **Water Rate Analysis for North Logan City**

**DRAFT REPORT**

**WATER RATE ANALYSIS**

For

NORTH LOGAN CITY, UTAH

Prepared by

Utah Division of Water Resources

December 2002

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## **OVERVIEW AND PURPOSE**

Acting upon a request from the North Logan-Mendon Water Conservation Advisory Committee, the Utah Division of Water Resources prepared a presentation to explain various water rate structures currently being used by community water systems around the state. Following a meeting with the North Logan City Council, division staff agreed to prepare a preliminary rate analysis using the increasing block rate structure. This analysis was subsequently presented to the advisory committee on August 6, 2002. Division staff was then asked to prepare a brief report and presentation for a later meeting with city officials and the water committee. Following that meeting the division prepared this report.

The purpose of this study is to assist North Logan City in setting a rate schedule designed to accomplish the following goals:

- Encourage water conservation
- Assure adequate funding of water system operations and the maintenance capital facilities.
- Provide information on cost of pumping water from city wells to new development located at higher elevations in the city.
- Discuss implication of charging the city for water used on city-owned landscapes
- Develop a series of tables showing the proposed rate schedule, the estimated impacts of water conservation on system revenues, and the change in monthly water bills prompted by the new rate schedule.
- Provide an effective written and oral presentation of the analysis results.

Since all facilities in the system are in good repair, the division was asked to not address funding for capital facilities replacement in the rate analysis. Charging for water service to customers outside the city limits was discussed but then deemed to be insignificant as was the issue of charging for fire flows and unplanned construction withdrawals from the city's water system.

## **ENCOURAGE WATER CONSERVATION**

Water conservation can be encouraged by the rate schedule when it is designed to send a signal to the customer that wise use is rewarded and waste is discouraged. This signal is best transmitted to ratepayers via the water bill. An model water bill is attached as Appendix A. Public hearings held to receive public input on water rate changes are often well attended but are soon forgotten. A monthly utility bill that presents information on the price of water in each tier and the cost of water used during the past billing period presents the customer with regular reminders of the cost of water. This allows the customer to make an informed choice whether or not he/she will use less water.

## **REVENUE REQUIREMENTS (cash basis approach)**

This part of the analysis compares the source of funds (revenues) with the application of funds (expenses) to determine the overall level of the new rates and to determine if additional revenue is needed now or at any time during the planning period of the analysis. The planning period for this analysis extends to 2007. Revenue requirements are based on demand growth (population) of 1.5 percent. Water system expenses are projected from the 2001 base, using the city's 2001 balance sheet and operating statement. Expenses are forecast to increase at three percent annually. The Revenue Requirements table in Appendix B shows the expense and revenue projections with the revenue requirement ranging from \$674,000 in 2003 to \$695,000 in 2007.

### **COST OF PUMPING TO HIGHEST ELEVATIONS**

Pumping water from Green Canyon Well #1 to the Beef Hollow Reservoir, a lift of 226 feet will cost about \$40 per acre-foot based on preliminary estimates. This adds approximately \$0.12/1000 gallons to the metered water rate if it were added to the water bills of people served at the higher elevations.

### **CHARGING THE CITY FOR WATER USE ON CITY LANDSCAPES**

It is common practice for cities to not include funding for the cost of water in its department budgets, but to pay all water related costs out of water enterprise fund revenues. As a result, the cost of water used on city landscapes is charged to the water enterprise fund and paid for by ratepayers. To do otherwise would require metering each landscape, including a line item in the annual budget for water, and paying the water bill to itself each year.

On the other hand, not requiring the city to budget money to pay for its water use reduces the city's incentive to conserve. From an accounting and economic point of view, not charging itself for the water it uses means water is seen by city staff as a free resource and there is no incentive for them to be efficient. In addition, residents must pay for water used by the city through their water bills meaning their water rate must be higher than it would be if the city paid. If a decision was made to include the cost of water, based on landscaped area, historical weather patterns, and the appropriate irrigation efficiency, in the appropriate department's budget, city staff may have more incentive to use less water. The cost reduction associated with conserved water would be a net savings to the city residents, i.e., ratepayers.

### **THE PROPOSED RATE SCHEDULE**

The proposed rate schedule shown in the first table on the next page has four tiers starting with a base rate set at \$8.00 per month for residential accounts. Water delivered through the meter is separated into two tiers, indoor and outdoor. For residential ratepayers, for example, the fee is set at \$1.00/1000 gallons for indoor use of 6000 gallons, and \$1.57 per 1000 for outdoor use up to 7,000. Additional water is provided for \$2.00/1000 gallons.

For commercial customers, 35,000 gallons is provided at \$1.00 per 1000 gallons, the next 50,000 gallons at \$1.57 and all additional water at \$2.00 per 1,000 gallons. Total revenue from all customer accounts is shown as \$679,000, assuming conservation will reduce use by 15 percent, based on the 2001 level of usage. The revenue requirement for 2003 is also shown. Tables showing the recommended base rates for various meter sizes and changes in water bills are presented in Appendix C.

<b>Recommended Monthly Rate Schedule</b>				
<b>Residential Accounts</b>			<b>Commercial Accounts</b>	
<b>Tier</b>	<b>Units(Kgal.)</b>	<b>Fee (\$)</b>	<b>Units (kgal)</b>	<b>Fee (\$)</b>
Base	0	8.00	0	Depends on meter size
Indoor	0 to 6	1.00	0 to 35	1.00
Outdoor	6 to 13	1.57	35 to 50	1.57
All Additional		2.00		2.00
<b>Total Revenue assuming a 15 percent reduction due to conservation from the 2001 level of use:</b>				<b>\$679,000</b>
<b>Total Revenue requirement in 2003:</b>				<b>\$675,000</b>

### **CHANGE IN WATER BILLS**

The percentage change in customer's water bills will increase as the amount of water use increases. The following table shows the change in monthly residential bills. The percentage change will increase as more water is used since a larger proportion is charged at \$2.00 per 1,000 gallons. See Appendix C for the change in commercial billings.

Residential Monthly Water Bill Comparison			
Usage (kgal.)	Total Bill with Current Rates	Total Bill with New Rates	Percent Change
10	22.81	20.28	-11.09
20	38.51	38.99	1.25
30	54.21	58.99	8.82
40	69.91	78.99	12.99
50	85.61	98.99	15.63
60	101.31	118.99	17.45
70	117.01	138.99	18.78
80	132.71	158.99	19.80
90	148.41	178.99	20.61
100	164.11	198.99	21.25
200	321.11	398.99	24.25

### **POLICY IMPLICATIONS**

One characteristic of the increasing block rate structure is that customers who use more water pay a higher rate or price. Put another way, the more water you use the higher the price you pay until water use reaches the top tier in the rate schedule. Consequently, adoption of the increasing block rate structure will tend to encourage smaller, more water wise landscapes and more efficient irrigation systems. This is consistent with current city policy, as demonstrated in the zoning and development ordinances to encourage smaller lots.

**APPENDIX A**  
**Model Water Bill**

Numbers in the attached sample water bill are consistent with the residential rate schedule provided in this report, and shows the format and type of information needed to communicate to the customer the incentive for conservation contained in the increasing block rate structure. It shows the prices for each block, and the amount of water taken, allowing the ratepayer to easily calculate the saving to be achieved by reducing water use. A water use profile can also be provided to show how current month's usage compares with past month and prior year use.

## ANYTOWN WATER DEPARTMENT

1234 Anystreet Avenue  
Anytown, UT 84001

Please return this portion  
WITH YOUR PAYMENT

John Doe  
7874 Shady Lane  
Anytown, UT 84001

Account : 135766551-01

Pay this amount: \$123.99

Account Name John Doe  
Service Address 7874 Shady Lane

Account: 135766551-01  
Meter ID: 877-4373

Billing Period 08/04/02 to 09/05/02

Previous Read	Current Read	Current Usage (gallons)
1255	1317	62,000

Your total use last year for this billing period was 57,000 gallons

Previous Balance \$0.00

Use Level (gallons)	@	\$/1,000	=	Total (\$)
1 – 6,000		1.00		6.00
6,001 to 13,000	1.57			10.99
13,001 to 62,000 = 49,000	2.00			98.00
Water Service Charge				\$8.00
TOTAL CHARGES				\$122.99

### Messages:

Check for leaks in your bathroom and kitchen - you'd be surprised how much water you'll save.

Please leave food bank donations for your postal carrier to pick up by 10/2/02.

## **APPENDIX B**

### **Revenue Requirements Table**

REVENUE REQUIREMENT FOR: North Logan				10/11/02			
Expense Growth Factor:		0.03(Used for Inflation Adjustment Also)					
Demand Growth Factor:		0.015					
Revenue Requirement:							
Year	2001	2002	2003	2004	2005	2006	2007
Estimated Water Usage (gallons)	408,993,000	415,127,895	421,354,813	427,675,136	434,090,263	440,601,617	447,210,641
Number of Connections Resid.	1,704	1,730	1,756	1,782	1,809	1,836	1,863
Number of Connections Com.	71	72	73	74	75	76	78
Operating Expenses							
Utilities							
Energy	\$ 52,000	\$ 54,363	\$ 55,179	\$ 56,007	\$ 56,847	\$ 57,699	\$ 58,565
Treatment Materials							
Other							
Salaries and Benefits	113,000	141,390	145,632	150,001	154,501	159,136	163,910
Professional Fees	20,000	20,600	21,218	21,855	22,510	23,185	23,881
Sytem Repair & Maint.	39,000	40,170	41,375	42,616	43,895	45,212	46,568
Facilities	35,000	36,050	37,132	38,245	39,393	40,575	41,792
Other	10,000	10,300	10,609	10,927	11,255	11,593	11,941
General Fund for Adm	52,000	53,560	55,167	56,822	58,526	60,282	62,091
Depreciation	177,000	177,000	177,000	177,000	177,000	177,000	177,000
Total Operating Expense	\$ 498,000	\$ 533,433	\$ 543,311	\$ 553,473	\$ 563,927	\$ 574,682	\$ 585,747
Non Operating Expenses							
Debt Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Expense	200,000	194,000.00	188,180.00	182,534.60	177,058.56	171,746.81	166,594.40
Accounts Payable	-	-	-	-	-	-	-
Accrued Interest	-	-	-	-	-	-	-
Total Non Operating Expense	\$ 200,000	\$ 194,000	\$ 188,180	\$ 182,535	\$ 177,059	\$ 171,747	\$ 166,594
Total Revenue Requirement	\$ 698,000	\$ 727,433	\$ 731,491	\$ 736,007	\$ 740,985	\$ 746,429	\$ 752,341
Inflation Adjustment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue Requirement	\$ 698,000	\$ 727,433	\$ 731,491	\$ 736,007	\$ 740,985	\$ 746,429	\$ 752,341
Offsets							
Interest and other inc.	\$ 58,300	\$ 58,300	\$ 58,300	\$ 58,300	\$ 58,300	\$ 58,300	\$ 58,300
Rate Revenue Requirement	\$ 639,700	\$ 669,133	\$ 673,191	\$ 677,707	\$ 682,685	\$ 688,129	\$ 694,041
Rounded	\$ 640,000	\$ 670,000	\$ 674,000	\$ 678,000	\$ 683,000	\$ 689,000	\$ 695,000
		2002	2003	2004	2005	2006	2007

**APPENDIX C**  
**Commercial Water Bill Changes**



### COMMERCIAL WATER BILL CHANGES

Current and recommended changes to the base rate for commercial customers are presented in the following table according to the size of pipe through which water is taken for delivery. Also shown is the percent change from old to new base rates, approximately 25 percent.

Change in Monthly Base Charge for Commercial Water Use			
Pipe Size	Current Base Charge (\$)	Recommended Base Charge (\$)	Percent Change
1.5	10.34	12.93	25.04
2	14.22	17.78	25.04
3	29.09	36.36	25.00
4	54.29	67.86	24.99
6	135.74	169.68	25.00

The recommended rate structure will increase the cost of water delivered to commercial customers as shown in the following table. A weighted average base rate of \$19 per connection was used in calculating the total bill with current rates. A weighted average base rate of \$23.76 per connection was used in calculating the total bill with new rates column. The change with additional usage ranges between -2.7 and 25.83 percent.

Commercial Monthly Water Bill Comparison			
Usage (kgal.)	Total Bill with Current Rates (\$)	Total Bill with New Rates (\$)	Percent Change
10	34.71	33.76	-2.74
20	50.41	43.76	-13.19
30	66.11	53.76	-18.68
40	81.81	66.61	-18.58
50	97.51	82.31	-15.59
60	113.21	98.01	-13.43
70	128.91	113.71	-11.79
80	144.61	129.41	-10.51
90	160.31	155.11	-3.24
100	176.01	175.11	-.51
200	333.01	375.11	12.64
1,000	1,589.01	1,975.11	24.30
2,000	3,159.01	3,975.11	25.83

Because the first 35,000 gallons of usage each month is priced lower under the suggested new rates than under current rates, commercial users will pay less, on average, for usage up to 100,000 gallons. This will encourage non-residential water users to practice conservation sufficient to keep use below that level.

## **Information to be included with building permits**

# RESIDENTIAL LAWN WATERING GUIDE

for  
**Cache Valley**

## *DO YOU KNOW YOU COULD USE LESS WATER AND HAVE A HEALTHIER LAWN?*

Most of us use drinking water to grow our lawns, flowers and other plants. On average, we use nearly two-thirds of our water out doors, most of which goes on lawns. As much as one-half of the water is wasted through incorrect watering.

If you can answer these questions, you are probably watering correctly.

- 1. Do you know how much water you apply each time you irrigate your lawn?**
- 2. Are you applying the water to your lawn evenly?**
- 3. Do you know when your lawn needs water?**

If you cannot answer these questions, the following three simple steps will help you find the answers and put you on the path to correctly irrigate your lawn.

**STEP 1. Check Distribution Uniformity (Pattern) of Your Sprinklers.** Remember, not all sprinklers apply the same amount of water. This is true of automatic, manual, or hose systems.

To check the distribution pattern, you will need at least 4 containers. Straight-sided containers like soup cans or milk cartons are fine but shallow tuna cans are too shallow and water splashes out. You may also use special water measuring cups (available from local Utah State University Extension Offices).

**A)** Place the 4 or more containers in a grid pattern over the lawn area to be checked.

**B)** Run your sprinklers for a period of time (at least 10 minutes) over the lawn. If you have over-lapping sprinklers that run at different times, run both sets of sprinklers. Check each container and see if the amount of water in each is about the same. Make a note of those containers (areas) that have more or less water than average. Try the following suggestions to apply water more evenly:

- Set the sprinklers to run for longer or shorter periods of time if they are on different valves.
- Check and repair clogged, damaged, or broken sprinkler heads. Also look for sprinklers that may be set into the ground too deeply or tilted. Sprinklers should be vertical and should not be obstructed by surrounding grass, plants, or other objects.
- Sprinklers running on the same line or valve should be the same model and have the right nozzle to cover the desired area.

**C)** After making adjustments, empty the containers and try the test again. Continue to make adjustments and run the test until the system is applying water as evenly as possible.



Suitable test containers could include special water measuring cups, open-topped milk cartons, or soup cans.



Checking contents of container.

## STEP 2. Determine how long you should run your sprinklers to apply the right amount of water.

Most areas of Utah have average high temperatures of 90° - 100° F. The suggested irrigation application is ½ inch of water each irrigation.

**A)** In your 4 containers, measure and mark a ½ inch depth. Note that the ½ inch line on the special water measuring cups is just above the measured markings on the side.

**B)** Turn on your sprinklers and time how long it takes for water to reach the marks in each container. With overlapping set of sprinklers, split the run time equally between both sets of sprinklers. Figure the average run time for all containers.

**C)** If you see water running off your lawn, three or more soak cycles are recommended. Irrigate for three or more cycles allowing 1-hour in between each cycle. This will prevent water from running off the lawn.

**Example:** If your sprinklers take 21 minutes to apply ½ inch of water, you would use three 7-minute cycles. Run your sprinklers for 7 minutes each cycle and wait one hour in between each cycle.

## STEP 3. Set Your Watering Schedule

Now that you know **how long** to water each time you irrigate, you need to know **how often** to irrigate. The irrigation schedule shows how often to irrigate during the growing season.

This schedule is based upon average or normal weather conditions. Unusual warm conditions may require an occasional irrigation a day earlier than scheduled. Rain storms or cool periods may allow postponing or skipping an irrigation.

By following the above suggestions, you will apply the **maximum** amount of water required by the lawn. You will also use about half of the water the average Utah homeowner uses. This schedule could save you as much as **one-fourth** of your yearly water usage. Even so, you may still be using more than is necessary.

To use less water, you will need to make your sprinkler system more efficient or reduce the total number of irrigations you apply during the growing season. **Each unnecessary irrigation that can be eliminated will save enough water for about 104 showers, 52 baths, 52 loads of laundry, or 312 toilet flushes.**

Irrigation Schedule	
Month	Interval
Startup Until April 30	Once every 6 days
May	Once every 4 days
June	Once every 3 days
July	Once every 3 days
August	Once every 4 days
September	Once every 6 days
October 1 to Shutdown	Once every 12 days

**Every minute counts!**

For additional tips on how to irrigate more efficiently, contact your water supplier, local Utah State University Extension Horticulture Specialist, or one of the following organizations:

**Center for Water Efficient Landscaping**

[www.hort.usu.edu/CWEL](http://www.hort.usu.edu/CWEL)

**Central Utah Water Conservancy District**

**Jordan Valley Water Conservancy District**

**Salt Lake City Public Utilities**

**Sandy City Public Utilities**, 801-568-6048

**US Bureau of Reclamation**, 801-379-1000

[www.uc.usbr.gov/progact/waterconsrv/index.html](http://www.uc.usbr.gov/progact/waterconsrv/index.html)

**Utah Div. of Water Resources**, 801-538-7260

<http://conservewater.utah.gov>

**Utah Irrigation Association**

<http://www.utahia.org>

**Utah Nursery & Landscape Association**

<http://www.utahgreen.org>, 801-484-4426

**Utah State University Extension**

<http://ext.usu.edu>

**Utah Water Conservation Forum**

<http://www.utahwaterforum.org>

**Washington County Water Conservancy**

**District**, 435-673-3617

**Weber Basin Water Conservancy District**

<http://www.weberbasin.com>, 801-771-1677



# WATER-WISE LANDSCAPING

***Kelly L. Kopp***

Dept. of Plants, Soils and Biometeorology

***Teresa Cerny***

Dept. of Plants, Soils and Biometeorology

***Rick Heflebower***

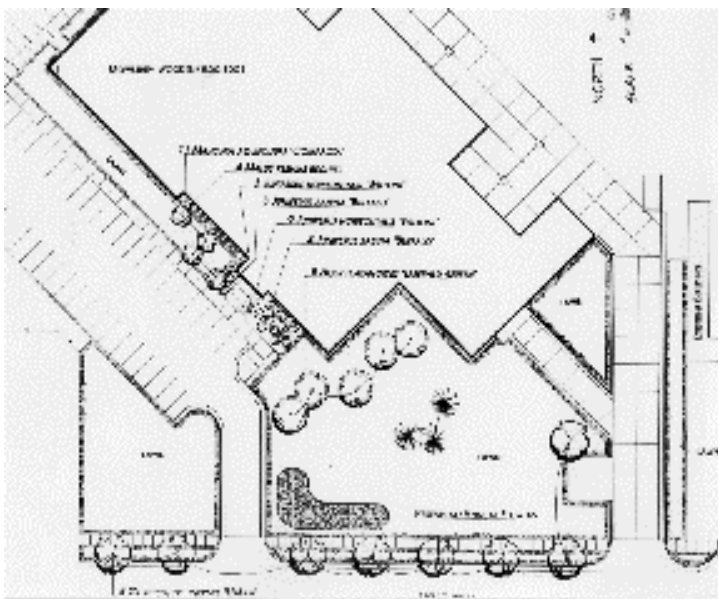
Washington County Extension Horticulture Agent

May 2002

HG-518

A water-wise landscape is one that is functional, attractive, and easily maintained in its natural surroundings. A water-wise landscape also helps to conserve water. If you live in Utah, you have undoubtedly heard that Utah is one of the driest states in the nation, second only to Nevada. This fact, along with our relatively high level of water consumption and our population growth, has brought water conservation to the forefront of those natural resource issues currently facing the state. In Utah, approximately 65% of our annual culinary water consumption is applied to landscapes. Our irrigated landscapes provide us with many benefits that include beautiful surroundings, natural cooling, and the cleansing of our environment. However, Utah landscapes are often over-irrigated and a great deal of water conservation may be achieved by keeping a few water-wise landscaping principles in mind as we design, install, and manage our landscapes.

**1. Planning and Design.** The planning and design stage of landscaping provides you with the opportunity to consider and prepare for every aspect of your future landscape's use. Consider what you would like to achieve with your landscape. For example, will you need a play area for children and pets? Would you like to have a vegetable garden? Also consider the natural attributes (or problem areas) of your property. Are there extremely sunny or shady areas? Are there very wet or dry areas? If so, choose plants that will thrive in these locations. When choosing plants, also remember that different plants have different water





requirements and you should group them accordingly. These groupings of plants are known as hydrozones.

**2. Soil Preparation.** The most basic component of your landscape is the soil and many landscape problems can be avoided if an adequate amount of time is spent on properly preparing the soil before the landscape is installed. The types of plants that you are growing will have a bearing on the characteristics you require from a soil, but there are some general guidelines to follow. Two major concerns are adequate depth of topsoil and the quality of topsoil. A depth of 8-12" is ideal and will solve many problems in the future. For topsoil quality guidelines, consult the USU Extension bulletin "Topsoil Quality Guidelines for Landscaping" by Rich Koenig and Von Isaman.



**3. Plant Selection.** One of the most pleasurable aspects of landscaping is choosing the plants that appeal to you. Whether aesthetically, as with flowering plants, or practically, as with vegetables, plant selection is indicative of your personal taste. Recall from the Planning and Design section that your plants should be grouped into hydrozones according to their water requirements. In water-wise landscaping, this is a key principle. Also, consider plants that will do well in Utah's climate. By choosing plants that are adapted to your climate, you will save water and will spend less time trying to manipulate your landscape to suit them. However, higher water use plants do not have to be completely excluded from a water-wise landscape. They do need to be grouped together in locations that suit their needs recognizing that more water and attention will be required to maintain them.





**4. Practical Turfgrass Areas.** Turfgrass is the plant that covers the majority of the landscaped area in Utah. It is important in our landscapes for play and recreation and is an important design component of some landscapes. Turfgrass is also the plant that is most often over-irrigated in Utah landscapes. For that reason, it is important to consider the practicality of turfgrass areas. Avoid using turfgrass in areas that are hard to irrigate such as steep slopes or odd-shaped and narrow spaces. Always be aware of the use of the turfgrass area. If the area only receives traffic when it is mowed, perhaps another plant choice is more appropriate.



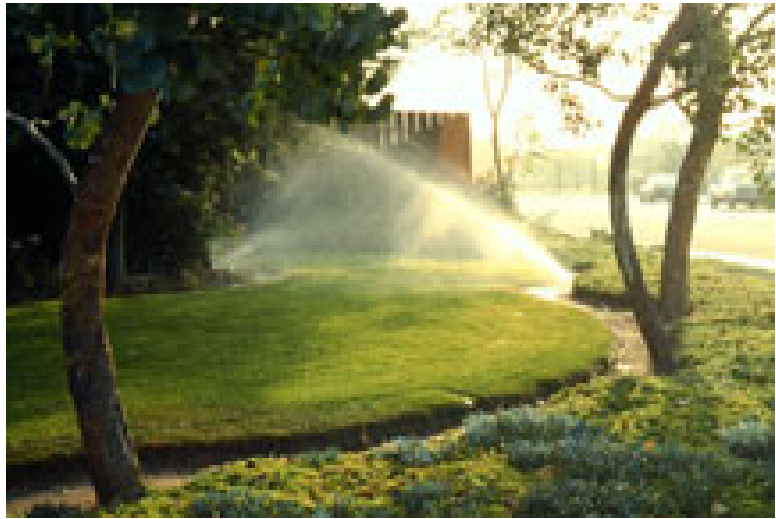
**5. Mulch.** Mulching is one of the easiest and best things that you can do in your landscape. By mulching around trees and planting beds, moisture is retained in the soil and weeds are discouraged. In addition, mulch tends to regulate the soil temperature making it a more stable environment for plant roots. There are many mulches available including organic mulches like bark, inorganic mulches like stone, and even some plastic and paper mulches.



You can even mulch your turfgrass areas by returning the clippings when you mow. One benefit of organic mulches is that they improve the organic matter content of the soil as they decay. This may be undesirable, however, for plants that require excellent drainage and dislike wetter soil conditions.

**6. Irrigation Planning.** By arranging your plants into hydrozones according to their water requirements, you have already begun the first steps in irrigation planning. Once your plants are arranged into hydrozones, you should plan your irrigation schedule to apply the appropriate amount of water to each of the zones. You can learn a great deal about plant-water requirements simply by observation. Signs, such as wilting, will let you know when many landscape plants require watering, but be careful not to overdo it. Plant roots need just as much air as water and you don't want to drown them. If you are using an automatic irrigation timer, be

sure to adjust it seasonally as the weather changes. A great deal of water is wasted when automatic irrigation systems are continually programmed for the hottest part of the summer without adjusting for times when temperatures are cooler and more natural precipitation is occurring. Another important aspect of irrigation planning includes routine maintenance of the system. Monthly examination of the irrigation system, while in use, will help you to find and repair any broken, misaligned, or clogged sprinkler heads and keep your system running efficiently.



### **7. Landscape Maintenance.**

One of the most important components of a beautiful and lasting landscape is maintenance. Proper maintenance will keep your plants healthy and will also help to conserve water. For example, by weeding regularly, your landscape plants will not have to compete with weeds for water. Also consider the fertility requirements of the plants in your landscape. Apply an adequate amount of nutrients, but do not over apply fertilizers since that will create excessive growth that will increase your maintenance requirements.



Excessive fertilization may also leave plants more susceptible to insects and diseases.

These seven principals provide the basis for creating a water-wise landscape of your own. For more detailed information on each of these water-wise guidelines will be provided in future fact sheets.

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Utah State University is committed to providing an environment free from harassment and other forms of illegal discrimination based on race, color, religion, sex, national origin, age (40 and older), disability, and veteran's status. USU's policy also prohibits discrimination on the basis of sexual orientation in employment and academic related practices and decisions.

Utah State University employees and students cannot, because of race, color, religion, sex, national origin, age, disability, or veteran's status, refuse to hire; discharge; promote; demote; terminate; discriminate in compensation; or discriminate regarding terms, privileges, or conditions of employment, against any person other wise qualified. Employees and students also cannot discriminate in the classroom, residence halls, or in on/off campus, USU-sponsored events and activities.

This publication is issued in furtherance of Cooperative Extension work. Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jack M. Payne, Vice President and Director, Cooperative Extension Service, Utah State University. (EP/DF/05-02)



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[Agricultural Water Uses](#)

[Home \(Indoor\) Water Conservation](#)

[Frequently Asked Questions](#)

[Upcoming Events](#)

[Drought and Weather Monitoring](#)

[Governor's Page on Water Conservation](#)

## Landscape Irrigation

Learn about efficient water management practices for lawn, garden and landscape plants. Maintaining a desirable landscape under our current drought conditions may require added attention to irrigation scheduling, water application rates, and the use of more water conserving plants.

Below you will find

information, links to publications, and other web sites to help you save w maintain a beautiful landscape.



### Landscape Tips

Mulch your planting beds and around trees to prevent soil moisture from evaporating.



### Contents

- [Extension publications](#)
- [Irrigation scheduling and system design](#)
- [Soil Considerations](#)
- [Lawn care](#)
- [Other related web sites](#)

### Extension publications on landscape water use

- Designing a low water use landscape (<http://extension.usu.edu/publica/gardpubs/hg525.pdf>)
- Efficient irrigation of trees and shrubs <http://extension.usu.edu/publica/gardpubs/hg523.pdf>
- Water-wise landscaping. <http://extension.usu.edu/publica/gardpubs/hg518.pdf>
- Living with landscape irrigation restrictions. <http://extension.usu.edu/publica/gardpubs/hg259.pdf>
- Water-wise landscaping. <http://extension.usu.edu/publica/gardpubs/waterwis.pdf>
- Desert plants of Utah.
- Selecting and planting landscape trees. <http://extension.usu.edu/publica/natrpubs/nr460.pdf>

- Selection and culture of landscape plants in Utah (Carbon, Emery, & San Juan Counties). <http://extension.usu.edu/publica/gardpubs/hg514.pdf>
- Garden Water Use in Utah  
<http://extension.usu.edu/publica/engrpubs/biewm37.pdf>
- Turfgrass Water Use in Utah  
<http://extension.usu.edu/publica/engrpubs/biewm36.pdf>

For more publications on horticulture and landscape topics see the Extension site at: <http://extension.usu.edu/coop/garden/gardpubs.htm>

### **Irrigation scheduling and system design**

- Evapotranspiration information for the Wasatch Front area.  
<http://www.conservewater.utah.gov/et/default.asp?summary.htm>
- Utah specific irrigation scheduling information.  
[http://www.uc.usbr.gov/progact/waterconservation/pub\\_select.html](http://www.uc.usbr.gov/progact/waterconservation/pub_select.html) and  
<http://www.conservewater.utah.gov/>
- The Center for Irrigation Technology. <http://cati.csufresno.edu/cit/>
- Waterright - an educational and irrigation scheduling resource for water managers. <http://www.waterright.org/>
- Southern Nevada Water Authority. <http://www.snwa.com/index.htm>
- Utah State University Cooperative Extension, Salt Lake County, lawn watering guide. <http://www.usuextension.slco.org/html/lawnwatering.htm>
- University of Nevada Reno Washoe Evapotranspiration project.  
<http://www.washoeet.dri.edu/>
- Utah State University Extension, Cache County evapotranspiration data and forecast. <http://utahreach.usu.edu/cache/ext/ET/index.htm>

### **Soil Considerations**

- Information about soil testing from the Utah State University Analytical Laboratory. <http://www.psb.usu.edu/tal/Soil.Science/usual/soiltest.htm>
- Frequently asked questions about soil testing.  
<http://extension.usu.edu/publica/gardpubs/hg513.pdf>
- Understanding your soil test report.  
<http://extension.usu.edu/publica/gardpubs/hg512.pdf>
- Water-wise landscaping: Monitoring irrigation with probes.  
<http://extension.usu.edu/publica/gardpubs/hg520.pdf>
- Water-wise Landscaping: Soil Preparation and Management  
<http://extension.usu.edu/publica/gardpubs/hg522.pdf>

### **Lawn care**

- Basic turfgrass care. <http://extension.usu.edu/publica/gardpubs/hg515.pdf>
- Growing turf on salt affected sites.  
<http://extension.usu.edu/publica/gardpubs/hg519.pdf>
- Top 10 turfgrass problems in Northern Utah.  
<http://extension.usu.edu/publica/gardpubs/hfs-01.pdf>
- Renovating your lawn after a long, hot summer.  
<http://extension.usu.edu/publica/gardpubs/lawns.pdf>

### **Other related web sites**

The following web sites contain drought, water use and water conservation information for home lawns, gardens and landscape plants.

- Utah State University Center for Water Efficient Landscaping.  
<http://www.hort.usu.edu/CWEL/>
- Utah Division of Water Rights, consumptive use information tables data on turf). <http://nrwrt1.nr.state.ut.us/techinfo/consumpt/default>
- Drought in Georgia. <http://interests.caes.uga.edu/drought/>
- Maryland drought information.  
<http://www.mde.state.md.us/drought/default.asp>
- North Dakota State University Extension, coping with droughts.  
<http://www.ag.ndsu.nodak.edu/drought/drought.htm>
- Colorado Drought Monitoring.  
<http://www.dola.state.co.us/oem/PublicInformation/Drought/drought>
- Washington State Department of Ecology.  
<http://www.ecy.wa.gov/programs/wr/drought/droughthome.html>
- Washington State University drought alert. <http://drought.wsu.edu>
- Landscape irrigation tutorials. <http://www.jessstryker.com/#Sprink>
- Marin, California water conservation site (landscape tips).  
<http://www.marinwater.org/waterconservation.html>
- The Horticultural Web. <http://www.floriculture.com>
- H2Ouse – Water House. <http://www.h2ouse.org/resources/links/in>
- H2Ouse - Water Saver Home. <http://www.h2ouse.org>
- Firewise. <http://www.firewise.org/>
- Water Wise Landscaping, Utah Botanical Center.  
<http://www.usu.edu/ubc/waterpage.html>
- UMass Drought Information <http://www.umassdroughtinfo.org/>

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**Mendon City  
Landscape Workshop Notice  
&  
Xeri Landscapes Examples**



# LANDSCAPE PLANNING WORKSHOPS

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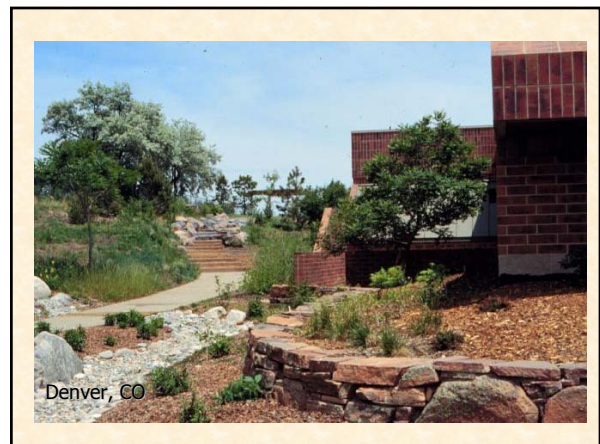
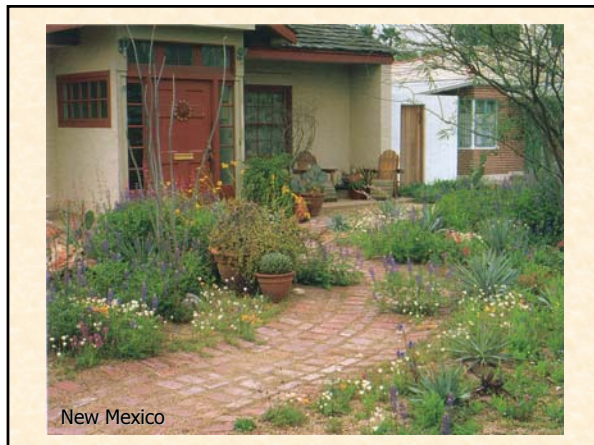
## **Mendon City Sponsors Free Landscape Planning Workshops**

Facing the daunting task of landscaping your new home, or are you tired of the old lawn and wanting to try something different? Mendon City is sponsoring 3 free workshops on landscaping using water-wise principles. The first workshop will focus on planning and design. The second will feature irrigation system design and the third will highlight plant selection. The workshops will be under the direction of USU Extension Horticulture Specialist, Loralie Platero.

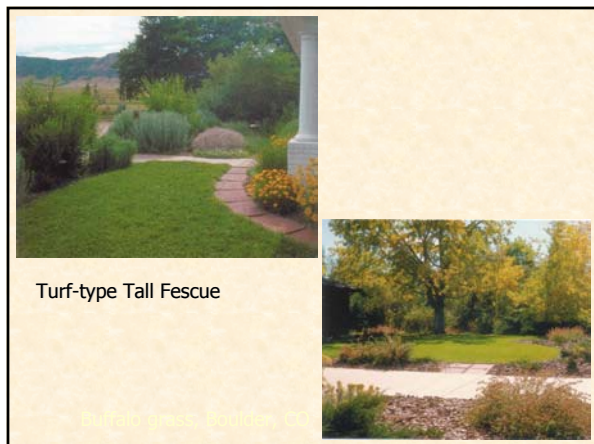
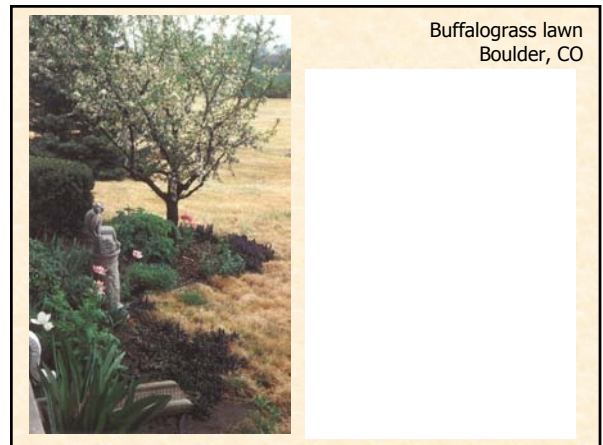
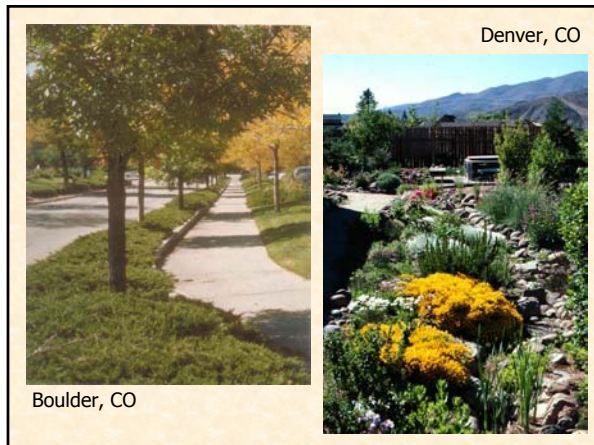
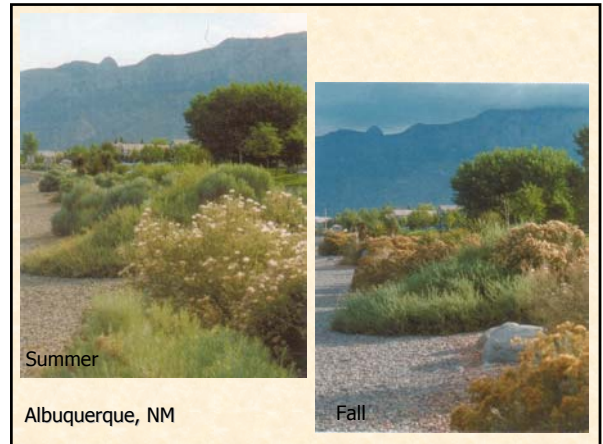
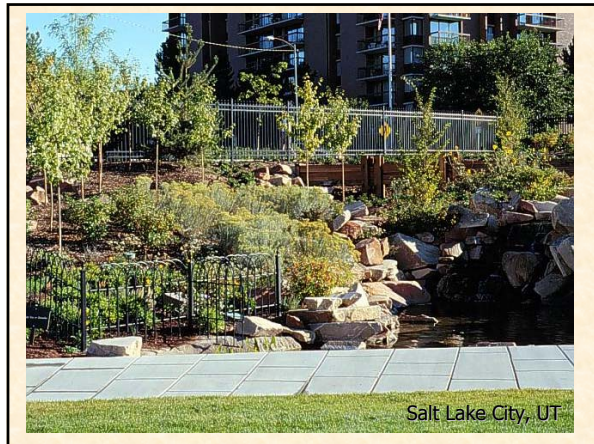
Where: New Mendon Firestation Classroom  
(100 North between 100 East & Main)

When: Tuesday, May 14<sup>th</sup> @ 7:00 p.m. (Planning and Design)

The remaining two workshops will be scheduled the first night with input from the group. Please RSVP to Daphne Carlson at 752-2449, or Jon Hardman at 755-6648, if you would like to attend. The workshops are open to anyone interested.

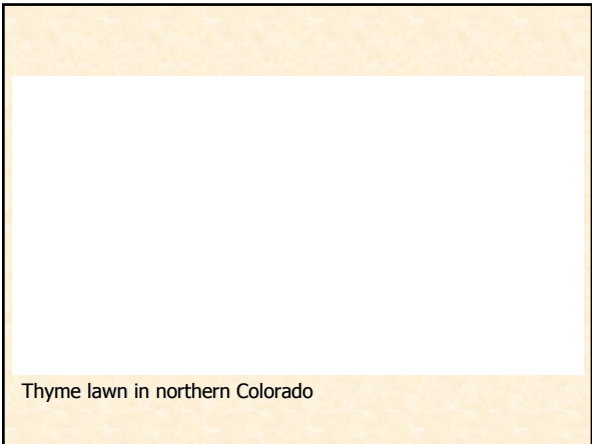




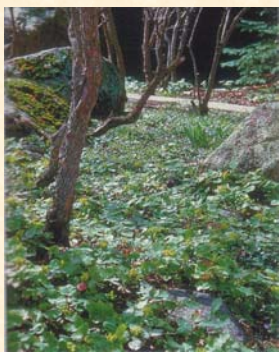




Gramma grass with wildflowers



Thyme lawn in northern Colorado

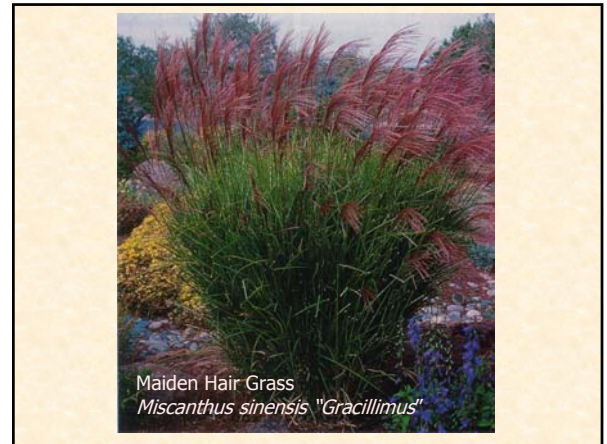
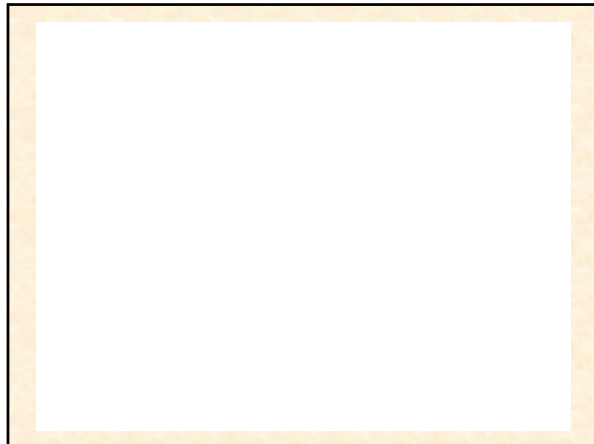


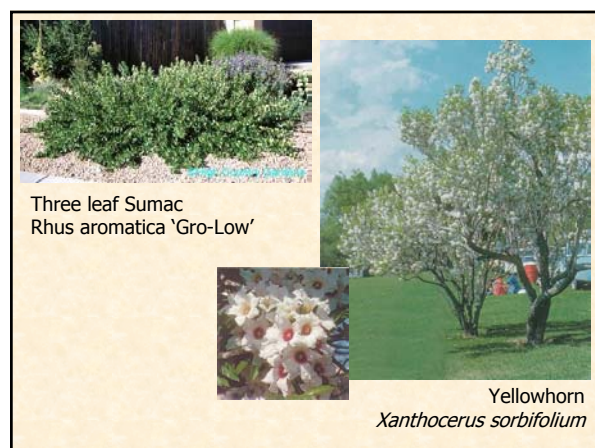
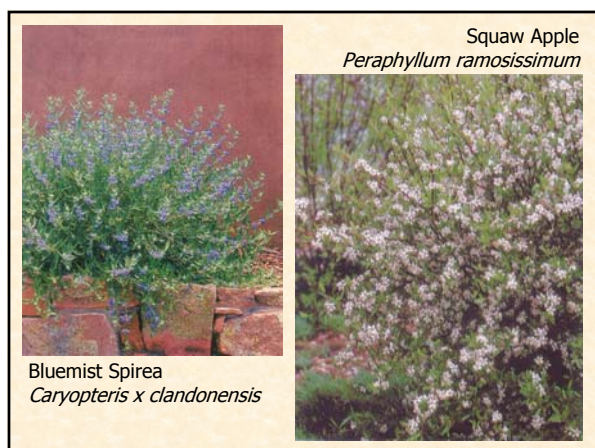
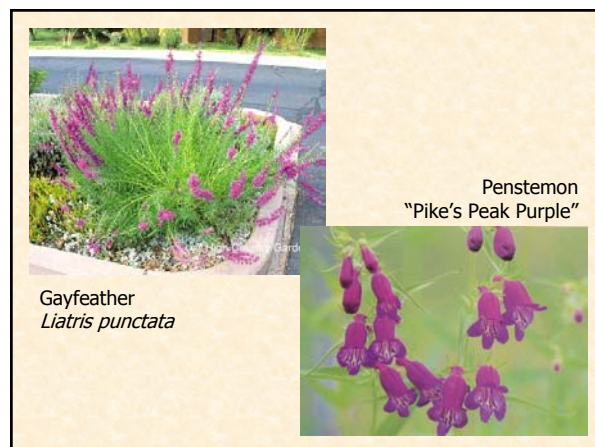
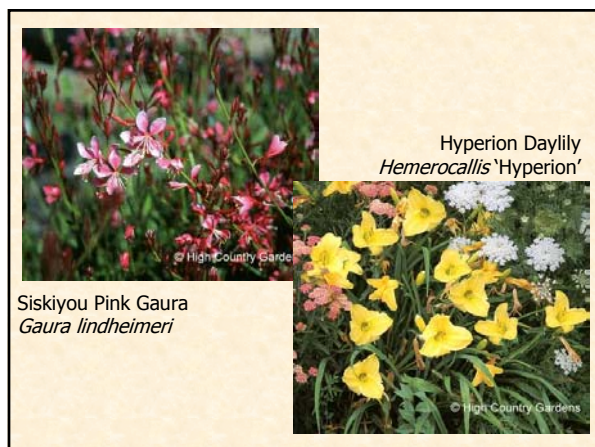
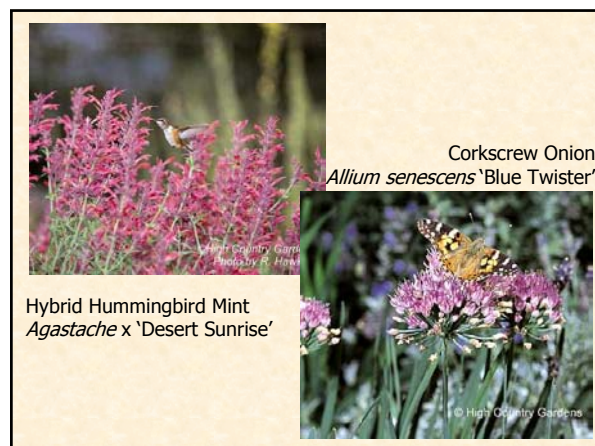
Creeping Mahonia

Woolly Thyme

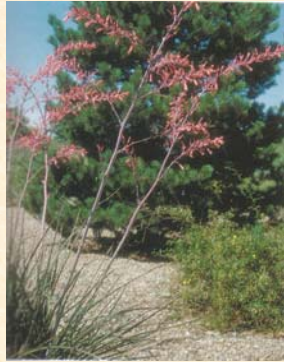












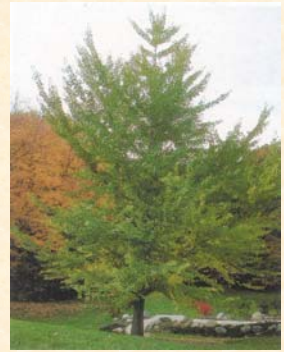
Red Yucca  
*Hesperaloe parviflora*



Curleaf Mountain Mahogany  
*Cercocarpus ledifolius*



Eastern Redbud  
*Cercis canadensis*



Ginkgo  
*Ginkgo biloba*



Golden Raintree  
*Koelreuteria paniculata*



Bald Cypress  
*Taxodium distichum*

# **Example Water Rates Ordinances & Resolutions**

## City of Draper

Connections:	2,000
Base Rate:	\$21.00
Allocation:	5,000
Overage 1:	\$1.75
Limit:	none

---

### **Chapter 5-11 WATER SERVICE FEES**

#### **Sections:**

**5-11-010 Allocation.**

**5-11-020 Collection - Deposit.**

### **Chapter 5-11 WATER SERVICE FEES**

#### **Section 5-11-010 Allocation.**

The City Manager shall propose a schedule with the advice and consent of the City Council by resolution setting out fees and costs to be charged for the providing of water services pursuant to such charges and services that the water department shall provide pursuant to Title 11, Chapter as have been established in Draper City Ordinances, 1989.

#### **Section 5-11-020 Collection - Deposit.**

The City Treasurer shall have the responsibility of collecting all such fees for concessions or rental or someone who has been delegated that authority in the City Treasurer's office by the City Council. All such sums as are collected for water service fees shall be deposited within seven days after receipt in the appropriate designated bank account.

#### **Notes:**

Although the city code calls for a resolution, it is a simple consolidated fee schedule voted on by council.

## City of Aurora, Utah

Connections:	335
Base Rate:	\$23.10
Allocation:	15,000
Overage 1:	\$1.75
Limit:	none

---

Resolution No. 2002-04-01

### A RESOLUTION SETTING THE CULINARY WATER USE RATES

Be it resolved by the Aurora City Council:

That in order for the city to meet the payment schedule necessary to pay the city's indebtedness and to meet the day-to-day financial requirements for the operation and maintenance of the city's culinary water system, it is hereby resolved by the Aurora City Council that effective July 1, 2002, the base monthly rate for 15,000 gallons of water is set at \$23.10 and that the rate for water usage over 15,000 gallons per month is set at \$1.75 per thousand gallons.

Passed this 17<sup>th</sup> day of April, 2002.

Aurora City

By     <Mayor>

Attest   <Recorder>

Notes:

## Ballard Water & Sewer District

Connections: 294  
Base Rate: \$20.00  
Allocation: 10,000  
Overage 1: \$1.10  
Limit: none

---

### AMENDMENT TO THE BY LAWS MARCH 19, 2002 FOLLOWING PUBLIC HEARING

The first 10,000 gallons, or fraction thereof, \$20.00 per month.  
For each 1,000 in excess of 10,000 gallon, \$1.10 per month.  
Hookup fee is \$1,800.00  
Impact fee is \$2,200.00  
Connection fee is \$100.00, returnable if bill is paid on time.

<President of the Board>      <Date>  
<Secretary>                      <Date>

#### Notes:

Public hearing advertised for 2 weeks. Last rate increase attracted LOTS of people. Added an impact fee with the raise. Lots of opposition, but once the board explained it, the people agreed. Explained that they need system improvement and fire protection and storage capacities. System installed in 1960's. Couldn't get grants to justify improvements. Drought made a subconscious difference.

## City of Coalville

Connections:	473
Base Rate:	\$14.45
Allocation:	8,500
Overage 1:	\$1.70
Limit:	none

---

### ORDINANCE NO. 1997-1

#### AN ORDINANCE RELATING TO THE COALVILLE WATER SUPPLY AND WATER WORKS.

...

#### ARTICLE III

##### FEES; RATES FOR USE; MISCELLANEOUS CHARGES; CONSEQUENCE OF NONPAYMENT

Section 1. Connection and Other Charges. A fee will be imposed for meter installation, automatic fire line connections, detector check valves, and other installations, inspections, water storage and other water facilities from time to time in amounts to be determined by the City Council and set forth in the Addendum. All charges hereunder may be amended by resolution of the City Council.

In all cases the pipe and type of materials to be furnished shall be approved by the City and shall be under the City's exclusive control. All necessary permits shall be obtained at the expense of the applicant.

Section 2. Replacement Charges. Where an old service pipe is replaced by a new service pipe of a different size, the charge shall be the same as for the installation of a new service meter of the different size.

Section 3. Unscheduled Charges to be Fixed by Director. All other charges for nonstandard size connections, and all work done by the city, including, but not limited to, cutting and replacing pavement where necessary, shall be fixed and charged as determined by the city.

Section 4. Water Rates. The rates for water use shall be as determined by the City Council and set forth in the Addendum. Water rates may be changed by Resolution of the City Council.

Section 5. Unscheduled Charges and Rates. Any rate for special or temporary use of water, service provided by the City, or special connection which is not provided for in the schedule of water rates shall be determined by the City Council as set forth in the Addendum, and may be amended by resolution.

Section 6. Billing Period. The City shall determine from time to time when monthly meter readings shall be made and bills rendered.

Section 7. Required Turn Off for Nonpayment. If any bill for water service remains unpaid fifteen (15) days after the due date, the City shall send out a Delinquent Notice. If the bill remains unpaid fifteen (15) days after the Delinquent Notice, the City shall send out a Shut Off Notice giving the water user fifteen (15) days in which to pay all amounts due and owing. In the event that all amounts due and owing on the water user's account are not paid on or prior to the Shut Off Date, the City of Coalville shall turn off the water user's water as a result of nonpayment.



Section 8. Partial Payments on Water User's Delinquent Accounts. Partial payments will be applied to the water user's account, but will not keep the water from being turned off. All amounts due and owing on the water user's account must be paid on or prior to the Shut Off Date to avoid shut off of the water.

Section 9. Turning on After Being Turned Off Prohibited. It shall be unlawful for any person to turn on, or allow the water to be turned on, or use, or allow the water to be used without the express authority from the City, after the water has been turned off from his premises because of non-payment of rates or other violation of the ordinances, rules and regulations pertaining to the water supply, or for any reason.

Section 10. Payments Required Before Turn-On. Before the water is turned back on, all unpaid bills for water must be paid in full, together with a reconnection fee, as set forth in the Addendum. The reconnection fee is subject to change by Resolution of the City Council.

Section 11. Average Rate Charged upon Failure of Meter. In the event that a water meter shall, for whatever reason, fail to register, or in the event that the meter cannot be read, a bill shall be rendered for the average rate of consumption for like periods of time.

## **RESOLUTION NO. 2001-5**

### **A RESOLUTION ESTABLISHING A CONSOLIDATED RATE SCHEDULE FOR CULINARY AND IRRIGATION WATER SERVICE PURSUANT TO ORDINANCE NO. 2001-1 AND PROVIDING FOR THE EFFECTIVE DATE THEREOF**

WHEREAS, the City has adopted Ordinance No. 2001-1 providing for the enlargement of the City's Water Department to include a secondary water system in addition to the existing culinary system; for the establishment of a consolidated rate schedule by Resolution of the City Council, and for collection procedures relating to such rate schedule; and

WHEREAS, after careful study, the Council has determined that in order to finance the construction of the secondary water system, it is necessary to issue and sell Irrigation Water Revenue Bonds, Series 2001, as provided for in Resolution 2001; and

WHEREAS, it has been determined that in order to provide sufficient revenues for the amortization of the said Revenue Bonds, it is necessary to increase rates by the adoption of a new rate schedule,

NOW THEREFORE, be it RESOLVED, that the following rate schedule be and the same is hereby adopted:

#### **CONSOLIDATED RATE AND FEE SCHEDULE FOR CULINARY AND SECONDARY IRRIGATION SERVICE**

##### **RATES**

##### **A. Culinary Water Service Within the City Limits.**

Rate. The rate is \$28 per month for each connection (the "debt service charge") plus monthly rates as follows for culinary water usage:

\$1 per 1,000 gallons to and including 10,000 gallons

\$2 per 1,000 gallons for usage in excess of 10,000 gallons to and including 30,000 gallons.

\$3 per 1,000 gallons for usage in excess of 30,000 gallons.

Billing. Billing shall be on a monthly basis as and when meters are read. During winter months or at such times as meters are not read, billings shall be estimated and then adjusted at such time as meters are read for the period between meter readings. At the request of the customer, and with the approval of the City, customer billings may be annualized based upon billings for the prior year, in which event monthly billings shall be averaged so that each month is billed at the same rate except for the final month of the annual period, at which time necessary adjustments shall be made to reflect actual charged for the total billing period. Unreadable meters will be billed on previous history or 10,000 gallons per unit if there is no accurate history.

**B. Culinary Water Service Outside the City Limits.**

Rate. The rate is \$28 per month for each connection (the “debt service charge”) plus monthly rates as follows for culinary water usage:

\$1.50 per 1,000 gallons to and including 10,000 gallons

\$3.00 per 1,000 gallons for usage in excess of 10,000 gallons to and including 30,000 gallons.

\$4.50 per 1,000 gallons for usage in excess of 30,000 gallons.

Billing. Billing shall be on a monthly basis as and when meters are read. During winter months or at such times as meters are not read, billings shall be estimated and then adjusted at such time as meters are read for the period between meter readings. At the request of the customer, and with the approval of the City, customer billings may be annualized based upon billings for the prior year, in which event monthly billings shall be averaged so that each month is billed at the same rate except for the final month of the annual period, at which time necessary adjustments shall be made to reflect actual charged for the total billing period. Unreadable meters will be billed on previous history or 10,000 gallons per unit if there is no accurate history.

**C. Irrigation Water Service – Secondary Water System.** No separate user rate unless and until established by the City Council.

The rate schedule adopted by this Resolution No. 2001-5 shall be and become effective upon completion of the secondary water system but in no event later than January 1, 2002. Upon completion of the Secondary Water System, the Council shall establish the exact effective date of the new rate schedule. The rates now in effect are as fixed by Resolution No. 1999-8. Said rates shall be increased by the rate schedule adopted by Resolution 2000-9 to become effective in the spring of 2001 at a date to be fixed by the City Council at its April or May meeting. The rates established by Resolution No. 2000-9 shall be superceded and replaced by the rates adopted by this Resolution No. 2001-5 at such time as said rates become effective.